WHAT IS CLAIMED IS:

1. A method of constructing a DNA library having an increased content of a first dsDNA by removing a second dsDNA, which is different from the first dsDNA, from a DNA library containing the first dsDNA whose content is to be increased and the second ds DNA, comprising:

(1) adding a third ss nucleic acid, which contains a homologous sequence to a 3' terminal portion of a first strand of the second dsDNA and whose 3' terminal has a different sequence from that of the second dsDNA; and a RecA protein to the DNA library, and leading to homologous recombination between the 3' terminal portion of the first strand of the second dsDNA with the third ss nucleic acid to form a triple stranded portion consisting of the first strand of the second dsDNA, the third ss nucleic acid, and a second strand of the second dsDNA, at the 3' terminal portion of the second dsDNA;

(2) adding Exonuclease I to the DNA library containing a homologous recombinant (triple stranded portion) to digest the first strand of the second dsDNA of the triple stranded portion;

(3) ligating a DNA fragment to circularize the first dsDNA; and

(4) removing linear DNA not reacted in the ligation treatment of (3), thereby constructing the DNA

library having an increased content of the first dsDNA.

2. The method according to claim 1 wherein the DNA library is a circular DNA library, further comprising a treatment for cleaving circular dsDNA prior to the (1).

3. The method according to claim 1, wherein the ligation is self-ligation.

4. A method of constructing a DNA library having an increased content of a first dsDNA by condensing the first dsDNA from a DNA library containing the first dsDNA whose content is to be increased, comprising:

(1) mixing a third ss nucleic acid which contains a homologous sequence to a 3' terminal portion of a first strand of the first dsDNA and contains a sequence capable of providing a restriction site at the 3' terminal portion thereof, and a fourth ss nucleic acid which contains a sequence capable of hybridizing to the 3' terminal portion of the third ss nucleic acid and forming the restriction site at the hybridized portion with the third ss nucleic acid and a label, and hybridizing the 3' terminal portion of the third ss nucleic acid and the fourth ss nucleic acid to form a fifth nucleic acid to forming a restriction site at the double stranded portion of the fifth nucleic acid;

(2) adding a RecA protein and the fifth nucleic acid obtained in the (1) to the DNA library and leading to homologous recombination between a part of the first

dsDNA and a portion of the third ss nucleic acid of the fifth nucleic acid to form a triple stranded portion formed of a first strand of the first dsDNA, the portion of the third ss nucleic acid, and a second strand of the first dsDNA, the 3' terminal of the fourth nucleic acid of the fifth nucleic acid flanked by the 5' terminal of the second strand of the first dsDNA;

(3) adding Exonuclease I to the DNA library obtained in the (2) to digest the first strand of the first dsDNA of the triple stranded portion;

(4) recovering a complex containing the fourth ss nucleic acid from the DNA library via the label;

(5) cleaving the restriction site of the complex recovered in the (4) by an appropriate restriction enzyme;

(6) ligating a DNA fragment cleaved in the (5) to circularize the first dsDNA; and

(7) removing a linear DNA not reacted in the (6), thereby constructing the DNA library having an increased content of the first dsDNA.

5. The method according to claim 4 wherein the DNA library is a circular DNA library, further comprising a treatment for cleaving circular dsDNA prior to the (1).

6. The method according to claim 1, wherein the ligation is self-ligation.

7. A kit for constructing a DNA library having an increased content of a first dsDNA by removing a second dsDNA, which is different from the first dsDNA, from a DNA library containing the first dsDNA whose content is to be increased and the second ds DNA, wherein the kit contains a RecA protein, an appropriate buffer, and Exonuclease I.

8. The kit for constructing a DNA library having an increased content of a first dsDNA by condensing the first dsDNA from a DNA library containing the first dsDNA whose content is to be increased in accordance with the method of claim 4, comprising a RecA protein, an appropriate buffer, and Exonuclease I.

9. The kit according to claim 8, further comprising a biotin-labeled oligonucleotide and streptavidin beads.